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Nutritional Status and Eating Practices among University Students in Selected Universities in Selangor, Malaysia

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ABSTRACT

University students tend to have poor eating practices and this is related to nutritional status. This cross-sectional study was done to assess nutritional status and eating practices among university student. A total of 200 students (45 males and 55% females) with the mean aged 20 years old from four Malaysian universities in Selangor participated in this study. Participants completed a set of questionnaire and multiple pass 24 h diet recall. Weight, height and waist circumference of participants were measured. Energy and nutrient intake was described in relation to the Recommended Nutrient Intake (RNI) for Malaysians. 16.7% male students and 20.9% female students were underweight while 17.8% of male student and 10% of female students were overweight. The mean energy intakes among male students were higher compared to female students (male: 1938.5 kcal, female: 1681.84 kcal). There was a significant difference in energy intake, protein and fat intake in regards to gender. More than half of the participants did not meet the Malaysian Recommended Nutrient Intake (RNI) for energy, protein (female only), calcium and iron (female only). Male students tend to skip breakfast compared to female student with the percentage of 65.6 and 52.8%, respectively. Most students consume fruits (male: 65.6, female: 58.3%) and vegetables (male: 45.6, female: 44.5%) in 1-4 times a week. It is about 33.3% of male students and 29.1% of female students consume fast food several times a week. Present findings suggest the need for intervention that focus on increasing personal valuation of health and nutrition.

Key words: Nutritional status, eating practices, body mass index, university students

INTRODUCTION

In Malaysia, the nutritional status is undergoing a nutrition transition (Khor, 2002). The prevalence of overweight is 29.71% for the Malaysian adults aged 18-59 years and this indicates that the problem of overweight in Malaysia is almost as serious as that for the developed countries reported in the 1999-2002 National Health and Nutrition Examination Survey (NHANES) and WHO, 2011 (Azmi *et al*., 2009). Globally, there has been an increased intake of energy-dense foods that are high in fat, salt and sugars but low in vitamins, minerals and other micronutrients (WHO, 2011). Second National Health and Morbidity Survey (NHMS II) determined that the overall underweight adults in Malaysian is 25.2% while other studies in smaller numbers of

subjects reported underweight rates for men and women at 7 and 11% in urban and 11 and 14% in rural areas, respectively in Malaysia (National Coordinating Committee on Food Nutrition, 2006). The prevalence of underweight among female students is higher than male students (Gan *et al*., 2011; Huda and Ruzita, 2011). Most university student did not meet the recommended intakes for most of the macronutrient and micronutrient (Sanlier and Unusan, 2007; Shimbo *et al*., 2004). Meal and snacking patterns have been shown to give effects on body weight (Song *et al*., 2005; Ma *et al*., 2003), cognition cardiovascular outcomes (Redondo *et al*., 1997), lipid profiles (Titan *et al*., 2001; Mann, 1997) and carbohydrate tolerance (Jenkins *et al*., 1994). College students tend to practice poor eating habits for instance skipping meals, low frequency of vegetables, fruits and fish consumption, prefer to fatty food and poor physical activity (Abolfotouh *et al*., 2007). Balanced and adequate nutrition is important to maintain good health and quality of life (Memis and Sanlier, 2010). Adequate nutrition for example balanced dietary intake is the right proportion of food nutrients needed for growth, energy and maintenance (Akinyemi and Ibraheem, 2009). Faulty nutrition exacerbated a wide spectrum of disease condition, diminishing the quality of life, personal productivity and longevity (Khattak *et al*., 2002). Eating regulation is known in which individuals can influence their own health and wellbeing in positive way, choosing a diet that based on nutritional recommendations for both content (e.g., low energy density meals) and pattern (e.g., eating breakfast daily) (Teixeira *et al*., 2011). University student may face difficulty in regulating eating behaviour since it is the transition of where they staying away from family home. Students living away from family home tend to develop poor eating habits compared to students who live at the family home (Angeliki *et al*., 2007). The selection of unhealthy food, high cost of healthy foods and the ease of availability of fast food may have a negative impact on university student's eating behaviours (Gan *et al*., 2011). Therefore, this study was carried out to obtain a preliminary understanding and gathered the data on the nutritional status and eating practices among university student so that future intervention can be planned to improve the nutritional status and to give nutrition education to university students.

MATERIALS AND METHODS

Subjects: A total of 200 young adults students from Universiti Teknologi MARA (UiTM), Universiti Putra Malaysia (UPM), Universiti of Selangor (UNISEL) and Management and Science University (MSU) were sampled by using convenience sampling method. This cross-sectional study was conducted on students that met the inclusion criteria which is full time registered student in the range of 18-26 years old and not pregnant, bedridden or having major physical activity. In this study, the aged of the students were between 18 years old to 24 years old with the mean age of 20 years old. Consent form was given prior to the data collection and participant in this study was fully voluntary.

Anthropometric measurements: The anthropometric measurements carried out were weight, height and waist circumference. Subjects were weight in light clothing without shoes using Seca 813 Digital Flat Scale to nearest 0.1 kg. Height was measured to the nearest 0.1 cm using Body Meters, Seca 240 Height Rod or Stadiometer. Body mass index (kg m^{-2}) was calculated for each subject. In this study, WHO (2000) cut-off points used to classify subjects as underweight, normal weight, overweight and obese. Waist circumference was measured by using standard measuring tape which is Seca 203 ergonomic circumference measuring tape to determine the abdominal obesity of the participants. The classification of waist circumference was based on the

World Health Organization/International Association for the Study of Obesity/ International Obesity Task Force (WHO/IASO/IOTF) classification for Asians (≥90 cm for men and ≥80 cm for women is at risk for abdominal obesity (WHO/IASO/IOTF, 2000).

Dietary assessment: Multiple Pass 24 h Diet Recall is use in this present study as the technique of dietary assessment. Wrieden *et al.* (2003) stated that the diet is assessed over a period of three to five days during which the respondent is asked to recall and describe all food and drinks consumed in the 24 h prior to the interview. This method is use because the precision is better compared with 24 h recall. The energy and selected nutrient content of the food intake were analyse using computer package based on the Malaysian Composition Table which is DIET 4. The mean daily intake of energy, fat, protein and selected micronutrient which are calcium and iron was analysed by using DIET 4. It is dietary data analysis software which based on the nutrient composition of Malaysian Foods. Energy and selected nutrient intake was compared to Recommended Nutrient Intake (RNI) by Malaysian as planned by National Coordinating Committee on Food and Nutrition (2005).

Eating practices assessment: Eating practices questionnaire is used to measure the eating practices among university student. It is modified from the combination of validated questionnaires. The questionnaire included the frequency of fast food intake, fruits and vegetables, fast food and so forth. The reliabilities of the total score for eating practices is Cronbach's $\alpha = 0.6$.

Statistical analysis: Data were analysed using SPSS version 18. Results were presented in regards to gender and as frequencies and percentage for categorical data and means and Standard Deviations (SD) for continuous variables. Independent t-test was used to measure differences between gender on the energy and selected nutrient intake. Chi-square test was used to find the associations between gender on breakfast, fruits, vegetable and fast food intake.

RESULTS

Table 1 shows socio-demographic characteristics of the participants according to the university. About 200 participants in this study were recruited from four universities. There are 45% (n = 90) of male students and 55% (n = 110) of female students were involved in this study. The mean age of the participants is 20 years old and ranged from 18-24 years of age. There are multiracial subjects in this study which included Malay, 81% (n = 162), Chinese, 2.5% (n = 5), Indian, 12% (n = 24) and other races, 4.5% (n = 9). It is about 69.5% (n = 139) of student stay in the residential college or hostel, 8.5% (n = 17) stay with parents and 22% (n = 44) of student stay by their own. Most of the family income of the participant is in the range RM 2000-5000 (28.5%, n = 57). Family income below than RM 1000 is high among students in public universities (UITM and UPM) compared to private universities (UNISEL and MSU) in this study. There is only 7% (n = 14) of the participants are smoking.

Anthropometric measurements: The anthropometric measurements of subjects are described in Table 2. It is about 20.9% (n = 23) female student is underweight. This is higher than male student which is 16.7% (n = 15). The prevalence of underweight is higher than the overweight or obese. In this study the cumulative percentage for underweight and overweight are 37.6% (n = 38) and 27.8% (n = 27), respectively. The overweight student for male student is higher compared to

Table 1: Socio-demographic information of university students (n = 50)

	UITM		UPM		UNISEL		MSU		Total	
Characteristics	n	%	n	%	n	%	n	%	n	%
Sex										
Male	18	36	27	54	25	50	20	40	90	45.0
Female	32	64	23	46	25	50	30	60	110	55.0
Age group										
18	29	58	31	62	3	6	4	8	67	33.5
19-24	21	42	19	38	47	94	46	92	133	66.5
Ethnicity										
Malay	50	100	45	90	33	66	34	68	162	81.0
Chinese	0	0	4	8	0	0	1	2	5	2.5
Indian	0	0	1	2	11	22	12	24	24	12.0
Others	0	0	0	0	6	12	3	6	9	4.5
Living										
Residential college/hostel	48	96	50	100	13	26	28	56	139	69.5
With parents	0	0	0	0	13	26	4	8	17	8.5
By own	2	4	0	0	24	48	18	36	44	22.0
Family income										
<RM 500	1	2	3	6	2	4	1	2	7	3.5
500-1000	13	26	11	22	10	20	5	10	39	19.5
1000-2000	8	16	10	20	18	36	15	30	51	25.5
2000-5000	14	28	18	36	9	18	16	32	57	28.5
>RM 5000	14	28	8	16	11	22	13	26	46	23.0
Smoking										
Yes	0	0	3	6	6	12	5	10	14	7.0
No	50	100	47	94	44	88	45	90	186	93.0

Table 2: Anthropometric profile of male and female students

	UITM		UPM		UNISEL		MSU		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Anthropometric	(n = 18)	(n = 32)	(n = 27)	(n = 23)	(n = 25)	(n = 25)	(n = 20)	(n = 30)	(n = 90)	(n = 110)
Body mass index (BMI)										
Underweight	5 (27.8)	5 (15.6)	3 (11.1)	7 (30.4)	5 (20)	3 (12)	2 (10)	8 (26.7)	15 (16.7)	23 (20.9)
Normal	9 (50)	24 (75)	18 (66.7)	13 (56.5)	15 (60)	15 (60)	11 (55)	15 (50)	53 (58.9)	67 (60.9)
Overweight	3 (16.7)	1 (3.1)	4 (14.8)	2 (8.7)	4 (16)	3 (12)	5 (25)	5 (16.7)	16 (17.8)	11 (10)
Obese	1 (5.6)	2 (6.2)	2 (7.4)	1 (4.3)	1 (4)	4 (16)	2 (10)	2 (6.7)	6 (6.7)	9 (8.2)
Waist circumference										
Normal	17 (94.4)	28 (87.5)	22 (81.5)	22 (95.7)	20 (80)	21 (84)	15 (75)	25 (83)	74 (82.2)	96 (87.3)
High risk of abdominal obesity	1 (5.6)	4 (12.5)	5 (18.5)	1 (4.3)	5 (20)	4 (16)	5 (25)	5 (17)	16 (17.8)	14 (12.7)

Values in brackets are percentage

female student by 7.8% where male student is 17.8% (n = 16) and female student is 10% (n = 11). There are also obese students for both male and female student. The percentage of obese student in male is 6.7% (n = 6), whereas female student is 8.2% (n = 9). It is about 17.8% (n = 16) of male student and 12.7% (n = 14) of female students had high risk of abdominal obesity.

Dietary intake: The comparison of energy and nutrient intake between male and female students in this study is presented in Table 3. There was a significant difference in energy, protein and fat

Table 3: Energy and nutrient intake by male and female students

	18 years old				19 years old and above					Total		
	Male		Female		Male		Female			Male	Female	
Nutrient	(n = 35)	RNI	(n = 32)	RNI	(n = 55)	RNI	(n = 78)	RNI		(n = 90)	(n = 110)	p-value
Energy (Kcal)	1923.09	2840	1756.84	2050	1948.25	2440	1651.07	2000		1938.47	1681.84	0.00*
	(477.62)		(363.34)		(440.07)		(388.46)			(452.55)	(382.72)	
									<RNI		82 (90.9)	79 (72.2)
									Meet RNI	-	-	
									>RNI	8 (9.1)	31(27.8)	
Protein (g)	67.74	65	61.59	54	73.62	62	63.59	55		71.33	63.01	0.004*
	(21.22)		(19.73)		(19.15)		(20.55)			(20.07)	(20.24)	
									<RNI	38 (42)	75 (68)	
									Meet RNI	2 (2.4)	2 (1.9)	
									>RNI	50 (56.4)	33 (30.2)	
Fat (g)	91.11	57-86	79.19	46-69	78.36	54-82	72.04	46-70		83.32	74.12	0.03*
	(41.84)		(26.31)		(25.59)		(26.12)			(33.25)	(26.26)	
									<RNI	19 (21.1)	16 (14.6)	
									Meet RNI	34 (37.5)	32 (28.9)	
									>RNI	37 (41.5)	62 (56.5)	
Calcium (mg)	414.03	1000	424.0	1000	416.24	800	420.65	800		415.38	421.63	0.1
	(197.57)		(319.4)		(178.3)		(200.56)			(184.94)	(239.65)	
									>RNI	88 (97.3)	108 (98)	
									Meet RNI	-	-	
									<RNI	2 (2.75)	2 (2)	
Iron (mg)	13.67	12	12.98	21	16.08	9	13.76	20		15.14	13.56	0.09
	(6.88)		(5.78)		(6.59)		(6.07)			(6.77)	(5.95)	
									<RNI	27 (30.3)	99 (90.5)	
									Meet RNI	-	2 (1.5)	
									>RNI	63 (69.8)	9 (8)	

Values in brackets are SD, RNI: Recommended Nutrient Intake according to NCCFN, 2005, *Significant differences between sexes were measured by the t-test, p, 0.05

in regards to gender. The macronutrient (protein and fat) intake in this study is high among male student as compared to female student. The current energy and selected nutrient intakes with RNI among university student according to gender and age group are describe as well in the same table. The mean of energy for both age group and gender is lower than the RNI. This shows that the students did not meet the RNI for Malaysians (National Coordinating Committee on Food Nutrition, 2005). It is about 67.7% of RNI for energy is met by male student in 18 years old group. Meanwhile, for female student in the same age group has achieved about 85.7% of RNI. For age group of 19 years old and above, it is about 79.8% of RNI for energy is met by male student. This is lower than female student where they have achieved about 82.5% of RNI for energy. The student were also not met the requirement for calcium and iron (female only) intake. In regards to percentage and frequency of students who meet the recommendation, it is about 90.9% (n = 82) of male students and 72.2% (n = 79) of female students did not meet the RNI for energy. There is 9.1% (n = 8) of male student and 27.8% (n = 31) of female student have exceed the RNI for energy. For protein intake, more female student did not meet the RNI compared to male student with the percentage of 68% (n = 75) and 42% (n = 38), respectively. It is about 56.4% (n = 50) of male students and 30.2% (n = 33) had exceed the RNI. Majority of the student had exceed their fat

Table 4: Frequency of different eating practices by male and female students

	UITM		UPM		UNISEL		MSU		Total		
	Male (N = 18)	Female (n = 32)	Male (n = 27)	Female (n = 23)	Male (n = 25)	Female (n = 25)	Male (n = 20)	Female (n = 30)	Male (n = 90)	Female (n = 110)	p-value*
Breakfast intake											0.187
Daily	9 (50)	19 (59.4)	11 (40.7)	17(73.9)	5 (20)	8 (32)	6 (30)	8 (26.7)	31 (34.4)	52 (47.3)	
Skip	9 (50)	13 (40.6)	16 (59.3)	6 (26.1)	20 (80)	17 (68)	14 (70)	22 (73.3)	59 (65.6)	58 (52.8)	
Fruits intake											0.59
Daily	2 (11)	9 (28)	4 (15)	3 (13)	2 (8)	6 (24)	5 (25)	5 (16.7)	13 (14.4)	23 (20.9)	
Several times a week	11 (61.1)	13 (40.7)	18 (66.6)	16 (69.6)	18 (72)	17 (68)	12 (60)	18 (60)	59 (65.6)	64 (58.2)	
Once or twice in 2 week	3 (16.7)	7 (21.9)	2 (7.4)	1 (4.3)	2 (8)	1 (4)	1 (5)	5 (16.7)	8 (8.9)	14 (12.7)	
Several times a month	1 (5.6)	-	3 (11)	3 (13.1)	1 (4)	1 (4)	1 (5)	2 (6.6)	6 (6.7)	6 (5.5)	
Never	1 (5.6)	3 (9.4)	-	-	2 (8)	-	1 (5)	-	4 (4.4)	3 (2.7)	
Vegetable intake											0.84
Daily	7 (38.9)	13 (40.6)	9 (33.3)	6 (26.1)	10 (40)	12 (48)	13 (65)	15 (50)	39 (43.3)	46 (41.8)	
Several times a week	7 (38.9)	14 (43.7)	17 (63)	14 (60.9)	11 (44)	8 (32)	6 (30)	13 (43.4)	41 (45.6)	49 (44.5)	
Once or twice in 2 weeks	2 (11)	2 (6.3)	-	-	2 (8)	2 (8)	-	1 (3.3)	4 (4.4)	5 (4.5)	
Several times a month	1 (5.6)	2 (6.3)	1 (3.7)	1 (4.3)	2 (8)	1 (4)	-	-	4 (4.4)	4 (3.6)	
Never	1 (5.6)	1 (3.1)	0	2 (8.7)	0	2 (8)	1 (5)	1 (3.3)	2 (2.2)	6 (5.5)	
Fast food intake											0.7
Daily	-	-	-	-	1 (4)	1 (4)	-	-	1 (1.1)	1 (0.9)	
Several times a week	1 (5.6)	4 (12.5)	8 (29.6)	4 (17.4)	14 (56)	9 (36)	7 (35)	15 (50)	30 (33.3)	32 (29.1)	
Once or twice in 2 weeks	1 (5.6)	9 (28.1)	4 (14.8)	5 (21.7)	5 (20)	9 (36)	6 (30)	6 (20)	16 (17.8)	29 (26.4)	
Several times a month	12 (66.7)	15 (46.9)	11 (40.7)	9 (39.1)	4 (16)	6 (24)	6 (30)	8 (26.7)	33 (36.7)	38 (34.5)	
Never	4 (22.2)	4 (12.5)	4 (14.8)	5 (21.7)	1 (4)	-	1 (5)	1 (3.3)	10 (11.1)	10 (9.1)	

Values in brackets are percentage, Several times a week = 1- 4 times a week, several times a month = 3 -4 times a month, *χ^2 analyses with significance at $p<0.05$

intake with the percentage of 41.5% (n = 37) of male student and 56.5% (n = 62) of female student. On the other hand, the percentage of student who did not meet the RNI for fat is 21.1% (n = 19) and 14.6% (n = 16) for male and female, respectively. More than 90% of both genders did not meet the RNI for calcium. It is about 97.3% (n = 88) of male students and 98% (n = 108) of female student did not meet the RNI. Male student had exceed iron intake more than female student with the percentage of 69.8% (n = 63) and 8% (n = 9). Large number of female students did not meet the RNI for iron as compared to male student (female: 90.5%, n = 99; male: 30.3%, n = 27).

Eating practices: About 34.4% (n = 31) of male student in this study take their breakfast daily, 59% (n = 65.6) of male student skipped breakfast. On the other hand, 47.3% (n = 52) of female student take breakfast daily and about 52.8% (n = 58) skipped breakfast. The intake of fruit is low and most university students consume fruits and vegetables several times a week which is 1-4 times in a week (male: 65.6%, n = 59; female: 58.2%, n = 64). The percentage of male and female student who consumed vegetable daily is 43.3% (n = 39) and 41.8% (n = 46), respectively. Most of the students from both male (36.7%, n = 33) and female (34.5%, n =3 8) students take fast food several times a month (3-4 times a month). About 33.3% (n = 30) male students take fast food several times a week (1-4 times a week). This is higher than female student which is 29.1% (n = 32). There is no association found between both gender in breakfast, fruit, vegetable and fast food intake (Table 4).

DISCUSSION

In this study, the prevalence of underweight is higher than the overweight or obese. This is similar with the study done by Huda and Ruzita, (2011) on Universiti Sains Malaysia (USM) students. The study stated that 27% of university students are underweight and 12% are overweight or obese. On the other hand, in this study the cumulative percentage for underweight and overweight are 37.6% (n = 38) and 27.8% (n = 27), respectively. This is might due to their energy consumption. Based on the nutrient analysis, the energy intake among the student in this study does not meet the recommendation intake as suggested by RNI. This is contradicting with the study done by Zabut (2005) which found high prevalence of overweight (20-25%) among students in Gaza Strip. However, the previous study was done among nursing student only and this study was done among student from various programs.

It is about 20.9% (n = 23) female student is underweight in this study. This is higher than male student which is 16.7% (n = 15). In the study done by Khor *et al.* (2009) stated that 49.1% of males preferred to have larger body size meanwhile 58.3% female student idealised smaller body size. This is supported by Kuan *et al.* (2011) which found that female were more concern about body weight, body shape and eating than males. Ansari *et al.* (2010), revealed that female are more desire to be thin or leaner body and tend to have more negative attitude towards their bodies. The desire to have lean body might also contribute to the prevalence of higher underweight among university student.

Low body weight is unhealthy because it is not only can increase the risk of clinical conditions such as anaemia and low body mass but it also lead to distortion of body image amongst teenagers and young adults (Ministry of Health, 2010). This can increase the risk of eating disorders such as anorexia and bulimia.

Foods eaten daily should come from variety of food in order to obtain a healthy and balanced diet. Angeliki *et al.* (2007) found that student living away from home had developed bad eating habits compared to students living at the family home. This effect was suggested to be from the responsibility for food preparation and purchasing for the first time.

Majority of the student in this study were deficient in their energy intake. The inadequacy of energy intake which derived from low energy intake in the diet could cause poor intake of other essential nutrient from the diet. Low energy consumption among university students also found in the study done by Joanna Szymelfejnik *et al.* (2008) which reported that the intake of energy, fat and carbohydrate among female student was lower than the recommended dietary intake. This is similar with the study done by Mirnalini *et al.* (2008) which also found that males had higher mean energy (1776 kcal) than females (1447 kcal).

In this study majority of female student did not meet the RNI for iron by 90.5% compared to male students which is 30.3%. This is also similar with the findings by Gan *et al.* (2011) which found high percentage of female students did not meet the RNI for iron compared to male student and this can lead to iron deficiency anaemia among those who did not meet the RNI. The researcher also found that the intake of calcium is lower than RNI among university students. Mirnalini *et al.* (2008) in the study found that the calcium intake was lowest for the age group of 18-39 years old in both male and female adults.

The low energy intake of subjects in the study could also be due to the habit of skipping breakfast as been investigated in the present study. It can be seen from the breakfast intake among the students from this study where the percentage of student who skipped the breakfast is quite high (Male: 59%, Female: 52.8%). Ozdogan *et al.* (2010) investigated that the leading cause for

skipping breakfast was lack of time. Moy *et al.* (2009) also suggested that the reason for breakfast skipping were lack of time to eat. Apart from that, the researcher also stated that lack of appetite, dislike to eat early in the morning and oversleeping are the reason for skipping breakfast. Breakfast is the most important meal that replenishes body and brain after a night's fast (Ming *et al.*, 2006). The researchers stated that the breakfast consumption may positively benefit memory, academic performance, attendance rate, psychosocial function and mood. Kim *et al.* (2005) stated that the academic performance of students was strongly associated with dietary behaviour.

Sanlier and Unusan (2007) revealed that there is a strong association between increased stress with body composition and daily energy and nutrients intake among women in Turkey. The researchers conclude that stress had a significant role that can contribute to underweight and overweight status and energy and food item consumption. In the study done by Sajwani *et al.* (2009) found that most of university students who perceive their lifestyle to be moderately or highly stressful might be linked to lack of proper time management and lack of sleep.

Skipping meal will not necessarily lead to weight loss. This is because people tend to overeat at the next meal. This can cause them to putting on weight. Therefore, university student should avoid this kind of eating practice so that they can maintain their health and have a better quality of life and could perform well in their study.

Yeh *et al.* (2010) reported that students who ate at fast food establishment had lower intake of fruits and vegetables compared to student that ate at restaurants. The findings also revealed that the intake of fruit and vegetable among student had decreased since beginning of college. Fast food consumption is said to be the barrier of fruit and vegetable intake as well. The study done by Unusan (2006) stated that increased in stress level is strongly associated with reduced intake of fruit and vegetable among Turkish university student. In this study, the average consumption of fruit and vegetables was several times a week (1-4 times). This is similar with the study done by Khalid *et al.* (2011) which found that the students taking fruits and vegetables in 3-4 times in a week. This is might due to the availability of the fresh fruits and vegetables tuck shops in the university itself.

The availability of fast-food restaurant can be the reason of the prevalence of fast food intake more than 3 occasions per week. The availability of fast-food restaurants is said to be associated to higher risk for overweight or obesity, higher intake of total energy, sugar-sweetened beverages, fat but low intake of healthful foods. Moreover, fast foods are quickly prepared and people can afford it since the priced is reasonable. This might be the reason of why university student consumed fast food because do not have much time to prepared food at home.

CONCLUSION

In this study, the prevalence of underweight is higher than the overweight or obese. Majority of the student in this study were deficient in their energy intake. In male student the mean energy was 1938.47 and male student is 1681.84 kcal. The student were also lacking in fat, calcium and iron intake. Students tend to skip their breakfast intake and their fruit and vegetable consumption was also low. Many students usually consume fast food several times in a week. Educational campaign regarding healthier food choices, lifestyle and weight management could make a positive impact on the health of the university student. The nutrition interventions should focus on increasing personal valuation of health and nutrition. Future research would be benefit if the study is design for longitudinal studies which would provide more information. It is also needs to including identifying the magnitude of the potential nutritional risks associated with skipping main meal intake especially in large sample size.

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REFERENCES

Abolfotouh, M.A., F.A. Bassiouni, G.M. Mounir and R.Ch. Fayyad, 2007. Health-related lifestyles and risk behaviours among students living in Alexandria University hostels. Eastern Mediterranean Health J., 13: 376-391.

Akinyemi, O. and A.G. Ibraheem, 2009. Assessment of nutritional status of queens college students of Lagos State, Nigeria. Pak. J. Nutr., 8: 937-939.

Angeliki, P., G.H. Jane, A. Scott and M. Kapsokefalou, 2007. Eating habits of university students living at or away from home in Greece. Appetite, 49: 169-176.

Ansari, W.E., Clausen, S.V., Mabhala, A. and C. Stock, 2010. How do I look? Body image perceptions among university students from England and Denmark. Int. J. Environ. Res. Public Health, 7: 583-595.

Azmi, M.Y., R. Junidah, A.S. Mariam, M.Y. Safiah and S. Fatimah *et al.*, 2009. Body Mass Index (BMI) of adults: Findings of the Malaysian Adult Nutrition Survey (MANS). Malaysia J. Nutr., 15: 97-119.

Gan, W.Y., M.T.M. Nasir, M.S. Zalilah and A.S. Hazizi, 2011. Differences in eating behaviours, dietary intake and body weight status between male and female Malaysian university students. Malaysia J. Nutr., 17: 213-228.

Huda, N. and A. Ruzita, 2011. Preliminary survey on BMI profile among USM main campus students. Pak. J. Nutr., 9: 125-127.

Jenkins, D.J.A., A.L. Jenkins, T.M.S. Wolever, V. Vukson, A.V. Rao, L.U. Thompson and R.G. Josse, 1994. Low glycemic index: carbohydrate and physiological effects of altered food frequency. Am. J. Clin. Nutr., 59: 706-709.

Joanna Szymelfejnik, E., W. Lidia and C. Roman, 2008. Magnesium, zinc and copper intake by polish university students. Pak. J. Nutr., 7: 436-443.

Khalid, U., F. Nosheen, M.A. Raza, M. Ishaque, M. Ahmad, S.R. Ahmad and F. Rubab, 2011. A comparative study about the daily intake of fruits and vegetables among female students of two universities of Faisalabad. Pak. J. Nutr., 10: 684-689.

Khattak, M.M.A.K., A. Khan and M.U. Khattak, 2002. Energy and nutrients intakes of male and female university students. Pak. J. Nutr., 1: 174-178.

Khor, G.L., 2002. Micronutrient deficiency and its alleviation: The case of Malaysia. Asia Pacific J. Clin. Nutr., 11: 377-381.

Khor, G.L., M.S. Zalilah, Y.Y. Phan, M. Ang, B. Maznah and A.K. Norimah, 2009. Perceptions of body image among Malaysian male and female adolescents. Singapore Med. J., 50: 303-311.

Kim, S.H., J.Y. Kim and C.L. Keen, 2005. Comparison of dietary patterns and nutrient intakes of elementary schoolchildren living in remote rural and urban areas in Korea: Their potential impact on school performance. Nutr. Res., 25: 349-363.

Kuan, P.X., H.L. Ho, M.S. Shuhaili, A.A. Siti and H.R. Gudum, 2011. Gender differences in body mass index, body weight perception and weight loss strategies among undergraduates in Universiti Malaysia Sarawak. Malays J. Nutr., 17: 67-75.

Ma, Y., E.R. Bertone, E.J. Stanek, G.W., Reed and J.R. Hebert *et al.*, 2003. Association between eating patterns and obesity in a free-living US adult population. Am. J. Epidemiol., 158: 85-92.

Mann, J., 1997. Meal frequency and plasma lipids and lipoproteins. Br. J. Nutr., 77: 83-90.

Memis, E. and N. Sanlier, 2010. Analysis of nutrition habits of the teachers and nurses. Pak. J. Nutr., 9: 1176-1182.

Ming, M.F., G.C. Ying and S.Z.M. Kassim, 2006. Eating patterns of school children and adolescents in Kuala Lumpur. Mal. J. Nutr., 12: 1-10.

Ministry of Health, 2010. Malaysian dietary guidelines. National Coordinating Committee on Food and Nutrition, Ministry of Health Malaysia.

Mirnalini, K., M.S. Zalilah, M.Y. Safiah, A. Tahir and M.D. Haslinda *et al.*, 2008. Energy and nutrient intakes: Findings from the Malaysian Adult Nutrition Survey (MANS). Malaysian J. Nutr., 14: 1-24.

Moy, F.M., S. Johari, Y. Ismail, R. Mahad, F.H. Tie and W.M.A. Wan Ismail, 2009. Breakfast skipping and its associated factors among undergraduates in a public university in Kuala Lumpur. Malaysian J. Nutr., 15: 165-174.

National Coordinating Committee on Food and Nutrition, 2005. Recommended Nutrient Intake for Malaysia. A Report of the Technical Working Group on Nutritional Guideling, National Coordinating Committee on Food and Nutrition. Minisrty of Health Malays, Putajaya.

National Coordinating Committee on Food and Nutrition, 2006. National plan of action for nutrition of Malaysia. Minisrty of Health Malaysia, Putajaya.

Ozdogan, Y., A.O. Ozcelik and M.S. Surucuoglu, 2010. The breakfast habits of female University students. Pak. J. Nutr., 9: 882-886.

Redondo, M.R., R.M. Ortega, M.J. Zamora, M.E. Quintas, A.M. Lopez-Sobaler, P. Andres and M.J. Gaspar, 1997. Influence of the number of meals taken per day on cardiovascular risk factors and the energy and nutrient intakes of a group of elederly people. Int. J. Vietnam Nutr. Res., 67: 176-182.

Sajwani, R.A., S. Shoukat, R. Raza, M.M. Shiekh and Q. Rashid *et al.*, 2009. Knowledge and practice of healthy lifestyle and dietary habits in medical and non-medical students of Karachi, Pakistan. J. Pak. Med. Assoc., 59: 650-655.

Sanlier, N. and N. Unusan, 2007. The relationship between body weight and stress and nutritional status in Turkish women. Pak. J. Nutr., 6: 339-344.

Shimbo, S., Z.W. Zhang, N. Matsuda-Inoguchi, K. Higashikawa, H. Nakatsuka, T. Watanabe and M. Ikeda, 2004. Effects of life away from home and physical exercise on nutrient intake and blood/serum parameters among girl students in Japan. Tohoku J. Exp. Med., 203: 275-286.

Song, W.O., O.K. Chun, S. Obayashi, S. Cho and C.E. Chung, 2005. Is consumption of breakfast associated with body mass index in US adults? J. Am. Dietetic Assoc., 105: 1373-1382.

Teixeira, P.J., H. Patrick and J. Mata, 2011. Why we eat what we eat: The role of autonomous motivation in eating behaviour regulation. Br. Nutr. Found. Nutr. Bull., 36: 102-107.

Titan, S.M., S. Bingham, A. Welch, R. Luben, S. Oakes, N. Day and K.T. Khaw, 2001. Frequency of eating and concentrarions of serum cholesterol in the Norfolk population of the European prospective investigation into cancer: Cross sectional study. Br. Med. J., 323: 1286-1288.

Unusan, N., 2006. Linkage between stress and fruit and vegetable intake among university students: An empirical analysis on Turkish Students. Nutr. Res., 26: 385-390.

WHO, 2000. Obesity: Preventing and Managing Global Epidemic. WHO Technical Report Series 894. World Health Organization, Geneva.

WHO, 2011. Obesity and overweight. http://www.who.int/mediacentre/factsheets/fs311/en/ [8 November 2011]

WHO/IASO/IOTF, 2000. The Asia Pacific Perspective: Redefining Obesity and Its Treatment. Health Communications Australia Pty Limited, Australia.

Wrieden, W., H. Peace, J. Armstrong and K. Barton, 2003. A short review of dietary assessment methods used in national and Scottish research studies. Working Group on Monitoring Scottish Dietary Targets Workshop, Scotland, pp: 1-17. http://www.food.gov.uk/multimedia/pdfs/scotdietassessmethods.pdf

Yeh, M., B. Matsumori, J. Obenchain, A. Viladrich, D. Das and K. Navder, 2010. Validity of a competing food choice constructs regarding fruit and vegetable consumption among Urban college freshmen. J. Nutr. Edu. Behav., 42: 321-327.

Zabut, B.M., 2005. Energy requirements, prediction of body fat and weight status analysis of nursing students in Gaza strip. Pak. J. Nutr., 4: 202-207.